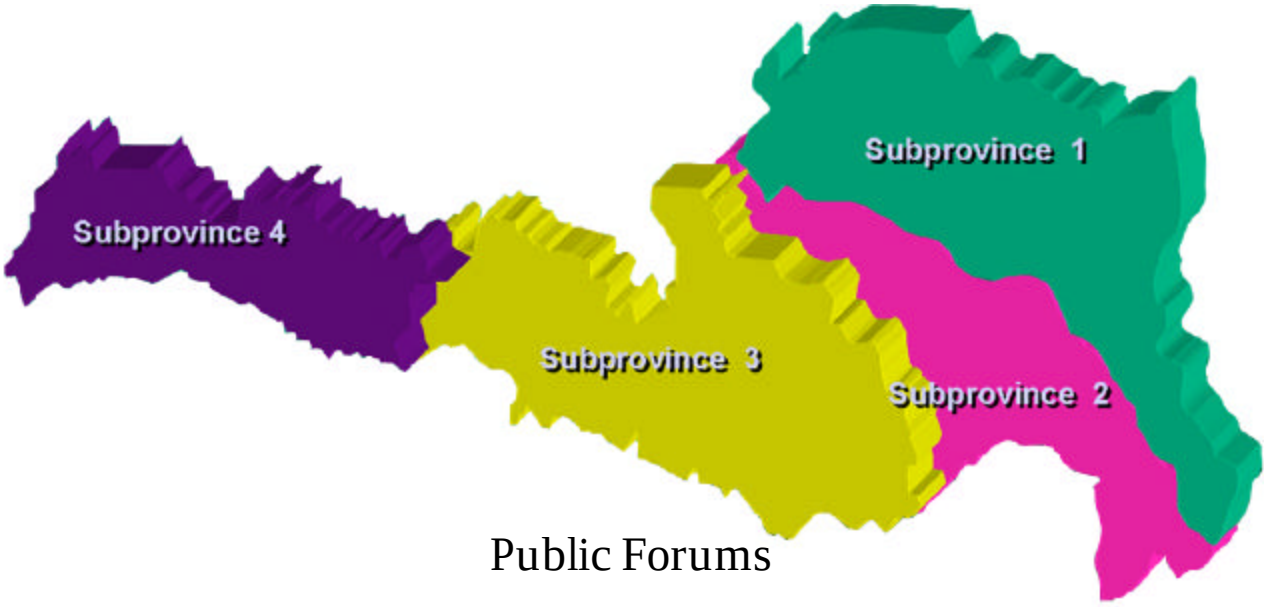
Introduction to Subprovince Alternatives for the LCA Study



Public Forums

Houma – May 27
Lafayette – May 28
Lake Charles – May 29
New Orleans – June 2

In partnership with Louisiana Department of Natural Resources and U. S. Army Corps of Engineers

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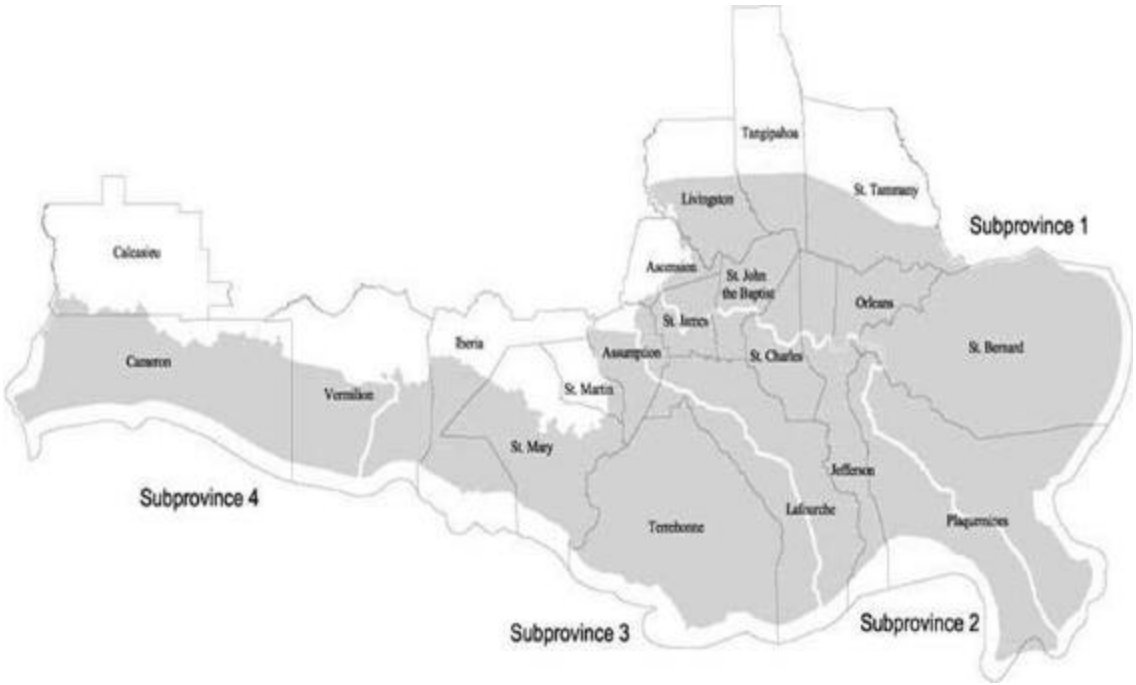
Introduction

The Coast 2050 Planning Process developed Regional Ecosystem Restoration Strategies through a series of 65 public meetings. Many of these strategies were conceptual in nature and required some level of design to examine potential effects of implementing these strategies. In Phase II of the LCA planning process, over one hundred restoration measures were developed. Measures are specific projects, such as freshwater re-introduction (also known as diversion), marsh creation, and barrier island restoration at specific sites. None of these measures represent a single and complete alternative. Therefore, measures must be combined to form alternatives. With so many measures to choose from, the possible combinations appear limitless. The goal, however, is not to develop as many alternatives as possible; rather, it is to examine different approaches for implementing the strategies in the 2050 plan In that sense, the alternatives should represent different hypotheses for testing the various strategies in the 2050 plan. Moreover, the alternatives need to be distinct enough to provide for real choice among them. In planning terminology, the alternatives must be "significantly different."

At the upcoming meetings, the LCA team will discuss these alternatives and their effectiveness. Discussions on these alternatives and how they were put together will be the focus of the open house. This will be followed by orientation and overview on the "no action" plan of the study and what is next in the LCA planning process. Lastly, public participation on the projected effects of these alternatives will take place in an informal and interactive setting. Questions regarding this document or the study in general can be directed to the study managers: Troy Constance at 504-862-2742 and Jon Porthouse at 225-342-9421. Continued public interest and support for the coastal restoration effort is essential to this evolving process.



The nineteen coastal parishes of the Louisiana Coastal Zone divided into the four LCA study subprovinces. White lines designate the subprovince boundaries.

Subprovinces 1 & 2

Problems, Opportunities and Proposed Project Types

Subprovince 1 encompasses the delta estuarine complex east of the Mississippi River, including the entirety of the Pontchartrain and Breton Sound basins and the eastern half of the Mississippi River Delta Basin. The major problems affecting wetland sustainability in this area are altered hydrology, both by isolating the wetlands from the influence of the Mississippi River, and by dredging the Mississippi River-Gulf Outlet (MRGO). In addition, the southern reach of this subprovince experiences some of the highest rates of subsidence in the coastal zone, >3.5 feet per century.

Despite the problems in this subprovince, the area has some of the best opportunities for large-scale sustainable restoration. In the areas north of lakes Maurepas and Pontchartrain, the influence of smaller rivers provides beneficial nourishment to wetlands. In addition, subsidence rates over much of the subprovince are relatively low. Lastly, outside of the Greater New Orleans area, the lands to the east of the Mississippi River are relatively sparsely developed, making reintroduction of riverine influence comparatively less disruptive to communities.

Restoration projects in this area will focus on reintroducing the Mississippi River to the delta plain and strategic application of dredged material to create marsh in critical areas. Closure of the MRGO is the subject of an ongoing study at this time. The LCA Comprehensive Report will include recommendations from the ongoing MRGO sutdy.

Subprovince 2 encompasses the delta complex between the Mississippi River and Bayou Lafourche, including the entirety of the Barataria Basin and the western half of the Mississippi River Delta Basin. The major problems affecting wetland sustainability in this area are altered hydrology, mainly by isolating the wetlands from the influence of the Mississippi River and dredging networks of oil and gas access canals and the Barataria Bay Waterway. While the levees along the river have prevented the nourishment and building of wetlands, the canals have facilitated tidal exchange with interior areas. These interior areas have generally more organic soils and are unable to withstand the increased tidal energy and saltwater influence. As the wetland area has declined, the tidal prism has increased and has contributed to increased barrier shoreline degradation. In addition, the southern reach of this subprovince experiences some of the highest rates of subsidence in the coastal zone, >3.5 feet per century. The western portions of this sub-province are far removed from the existing Mississippi River and the potential to deliver substantial amounts of sediment is relatively low. In addition, the subprovince is comparatively well developed, and this development presents challenges to restoring riverine influence to the area.

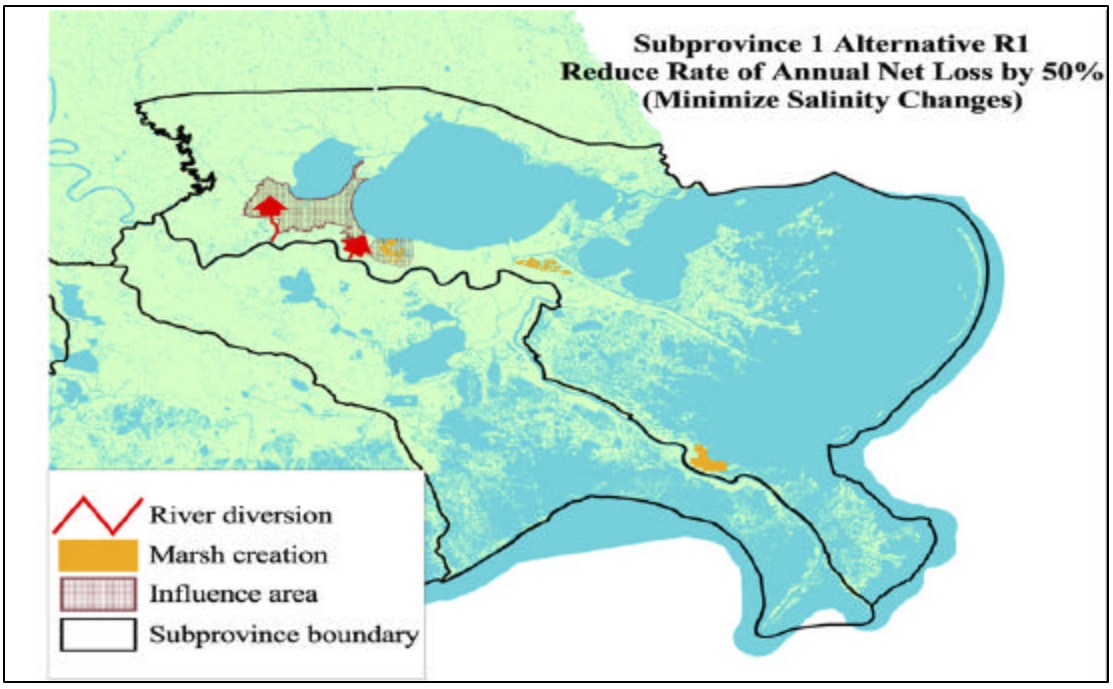
Despite the problems this area is experiencing, the proximity of the entire area to the Mississippi River minimizes the cost of direct river resource utilization. Restoration projects in this sub-province will focus on reintroducing the Mississippi River to the delta plain and strategic application of dredged material to create marsh in critical areas and barrier shorelines. These approaches allow for analysis of the water quality/hypoxia benefits that could be derived from maximum use of freshwater reintroduction.

We examined three different approaches for basin level restoration which relate specifically to the design, operation and ecosystem effects of reintroduction measures. These approaches are minimize salanity changes, continuous reintroduction, and mimic historic hydrolodgy.

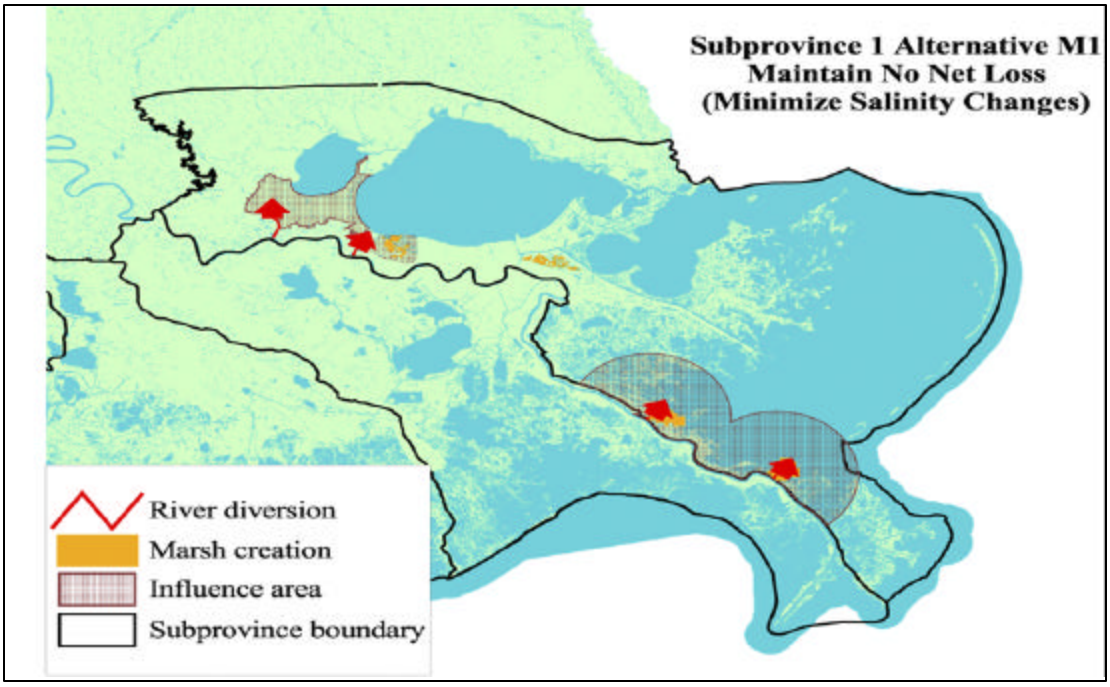
Minimize Salinity Changes

Freshwater reintroductions affect salinity gradients and, therefore, can result in significant ecological changes. Many of the societal and economic benefits currently provided by the ecosystem are currently based on the distribution of marsh types and salinity conditions that have prevailed for several decades. While the long-term goal of freshwater reintroductions is to ensure a healthy, productive, and sustainable coast, such measures can change fisheries and wetland habitat types such that local harvesters and communities can no longer realize these benefits. The question then becomes whether it is possible to minimize such potential changes, while still providing for a sustainable coastal ecosystem. Alternatives consistent with this conceptual framework rely less on freshwater reintroduction and more on marsh creation using external sediment sources (including off-shore and riverine sources). Although the primary measures for building marsh platforms are mechanical, limited freshwater reintroductions are included to help ensure the long-term sustainability of existing and restored wetlands. This approach was applied throughout both subprovinces, with the exception of the upper portion of subprovince 1, where salinity increases are already recognized as a threat to the ecosystem and reducing salinity should be a goal of any alternative.

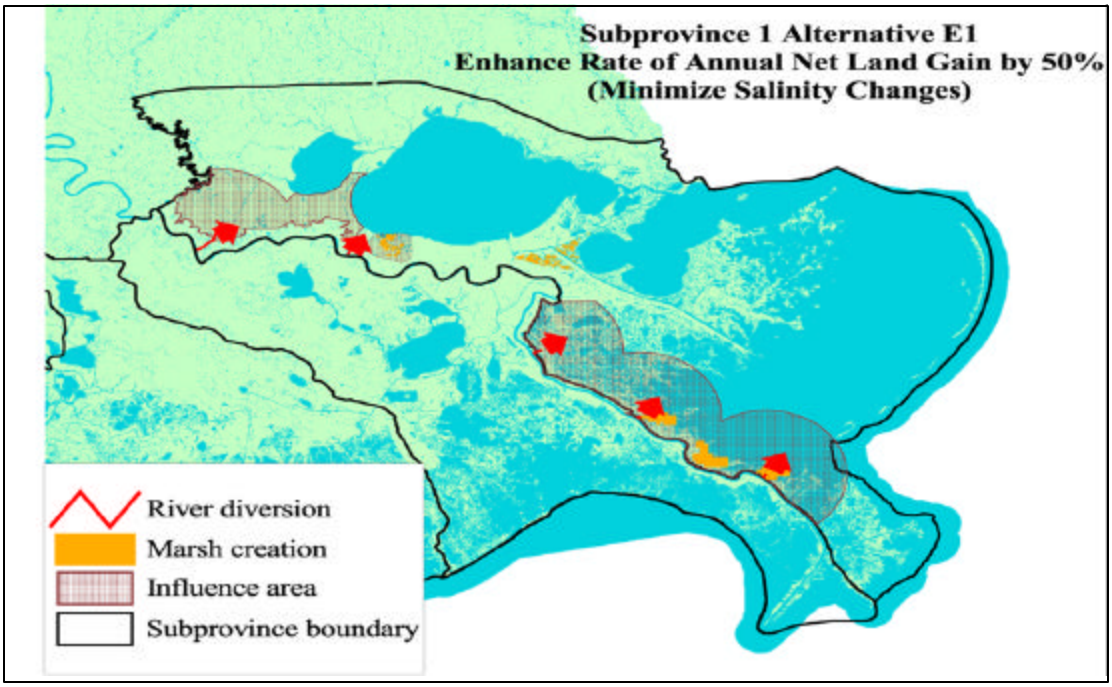
Maps of Minimize Salinity Change Alternatives



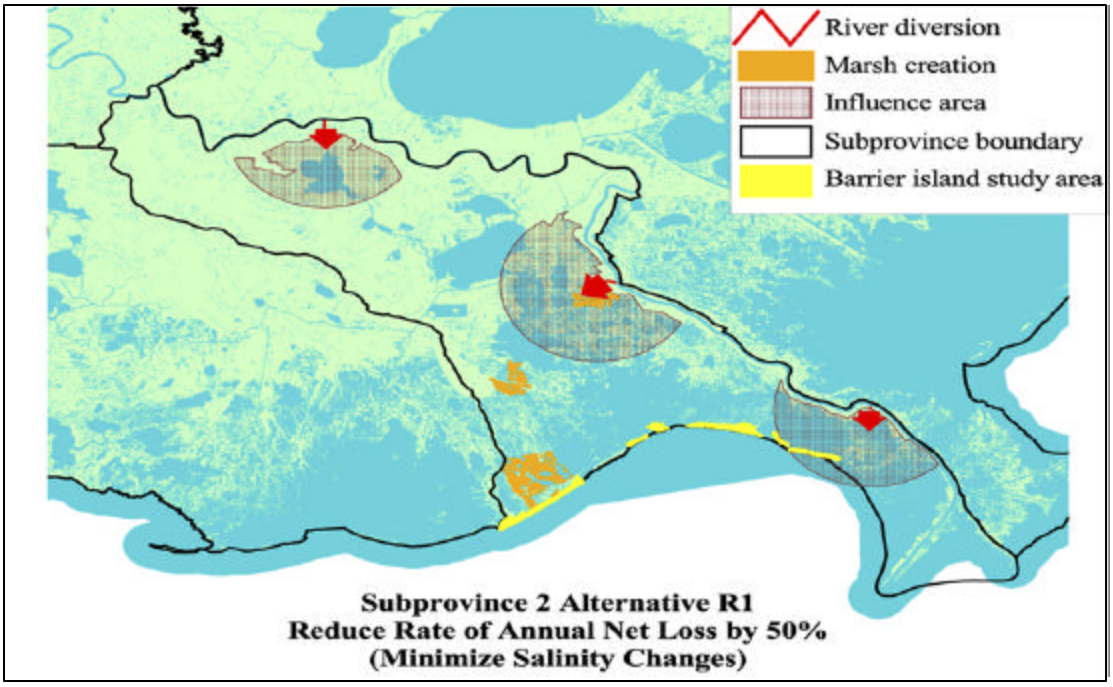
Alternative R1 – Minimize salinity changes
Two small diversions in the upper basin. Sediment delivery/marsh creation near Labranche and Quarantine Bay.



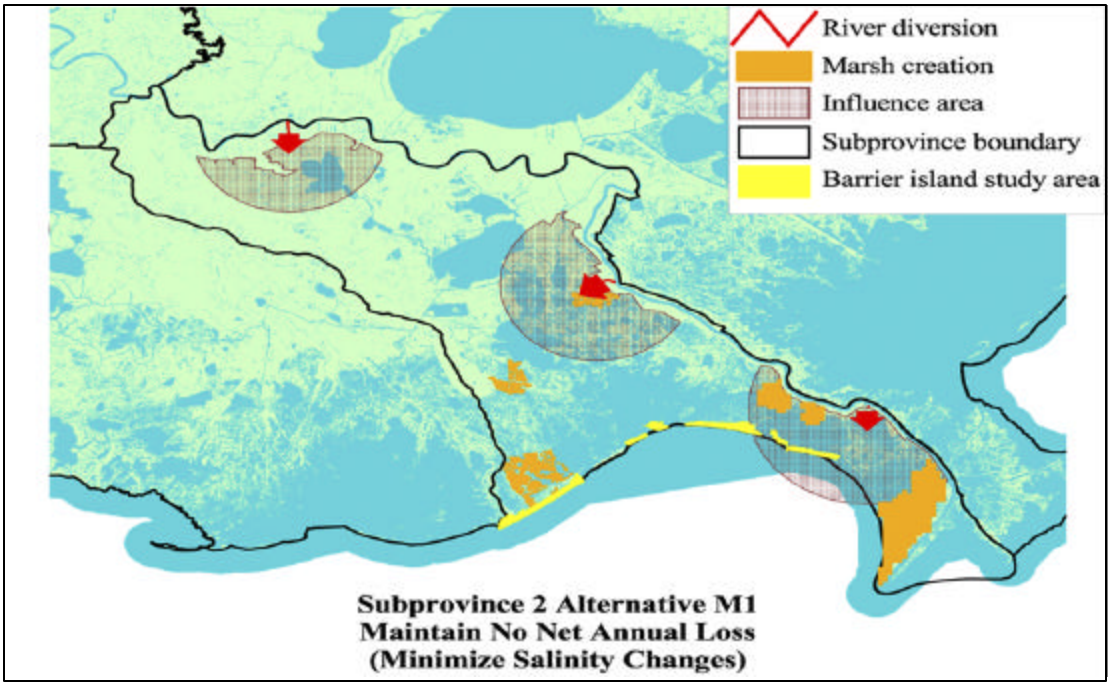
Alternative M1 – Minimize salinity changes
Two small diversions in the upper basin. Two medium sized diversions mid-basin. Sediment delivery/ marsh creation near Labranche, Central Wetlands, American/California Bay, and Ft. St. Philip.



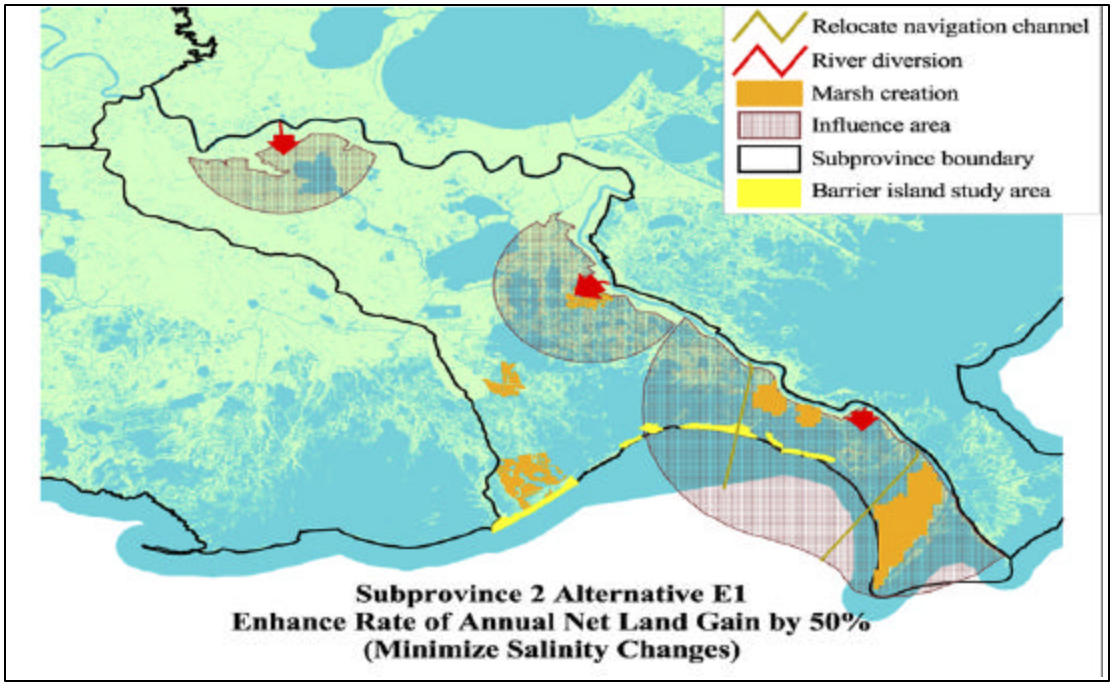
Alternative E1 – Minimize salinity changes
One small and one medium diversion in the upper basin. One small diversion mid-basin. Two medium diversions in the lower basin. Sediment delivery/marsh creation near Labranche, Central Wetlands, Golden Triangle, American/California Bay, Quarantine Bay, and Ft. St. Philip.



Alternative R1 – Minimize salinity changes
One small diversion in the upper basin. One small and one large diversion in the lower basin. Marsh creation with sediment at Myrtle Grove. Feasibility study of barrier shoreline and marsh creation in lower basin.



Alternative M1 – Minimize salinity changes
One small diversin in the upper basin. One small and one large diversion in the lower basin. Sediment delivery near Myrtle Grove, Empire, Bastian Bay, and Main Pass. Feasibility studies of the barrier shoreline and marsh creation in the lower basin.

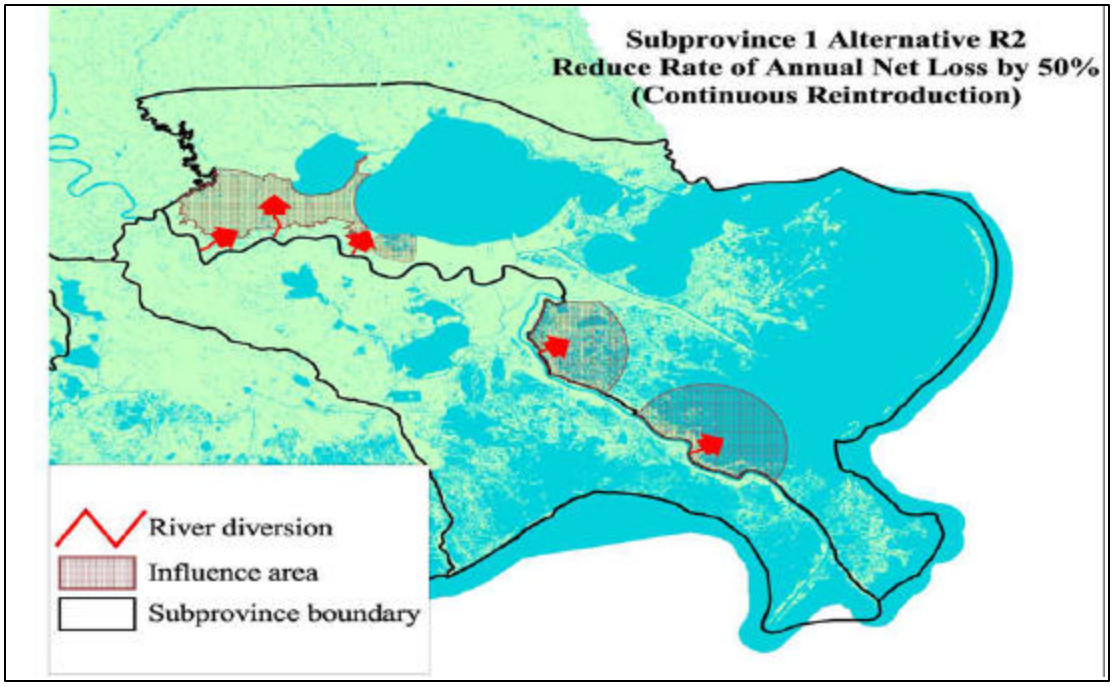


Alternative E1 – Minimize salinity changes
One small diversion in the upper basin. One small and one large diversion in the lower basin. Sediment delivery/marsh creation near Myrtle Grove, Empire, Bastian Bay, Main Pass, and from the river to marsh creation sites. Relocate main navigation channel.

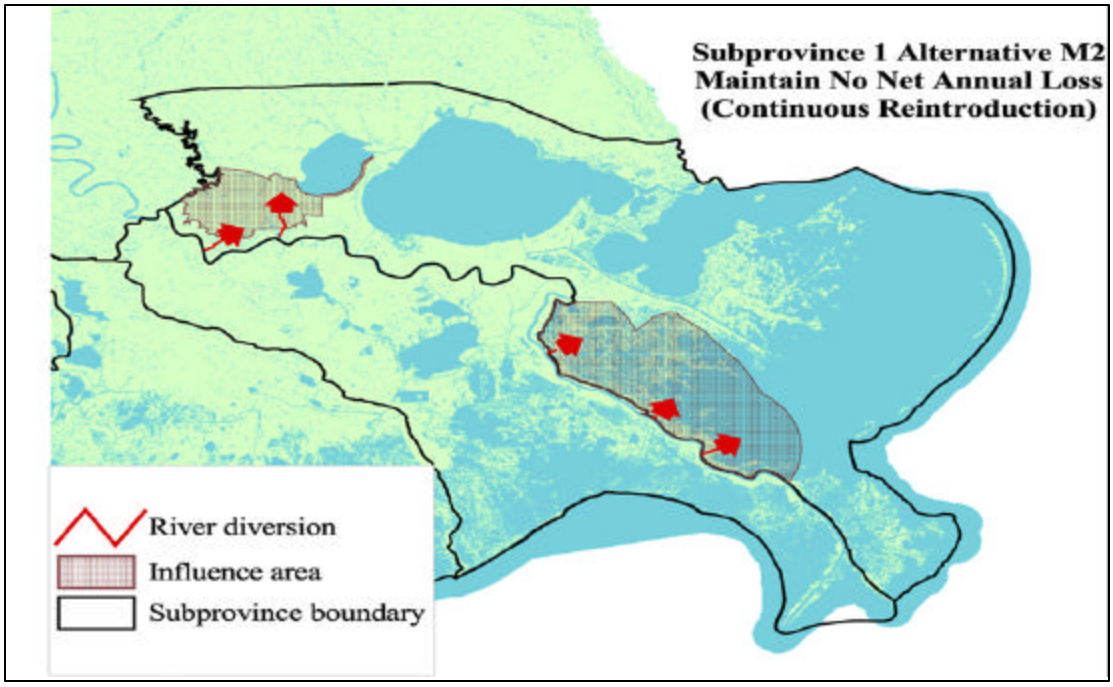
Continuous Reintroduction

In coastal Louisiana, the existing freshwater reintroduction projects (such as Davis Pond and Caernarvon) are for the most part operated with a continuous (i.e., year-round) flow, with discharge volume varying according to river stages and ceasing when river stages are too low. The existing reintroduction projects are relatively small compared to the far larger projects being contemplated in the LCA process. It is likely that the same approach to year-round reintroduction of water would provide effects at the larger scale that are not apparent with the existing diversions. Moreover, given that the natural deltaic process has been massively disrupted, the existing projects still fall far short of meeting the freshwater, nutrient, and sediment needs of Subprovinces 1 and 2. By developing alternatives around a "continuous reintroduction" approach, the LCA process will be able to assess the potential benefits and costs of using more and larger reintroductions that operate year-round.

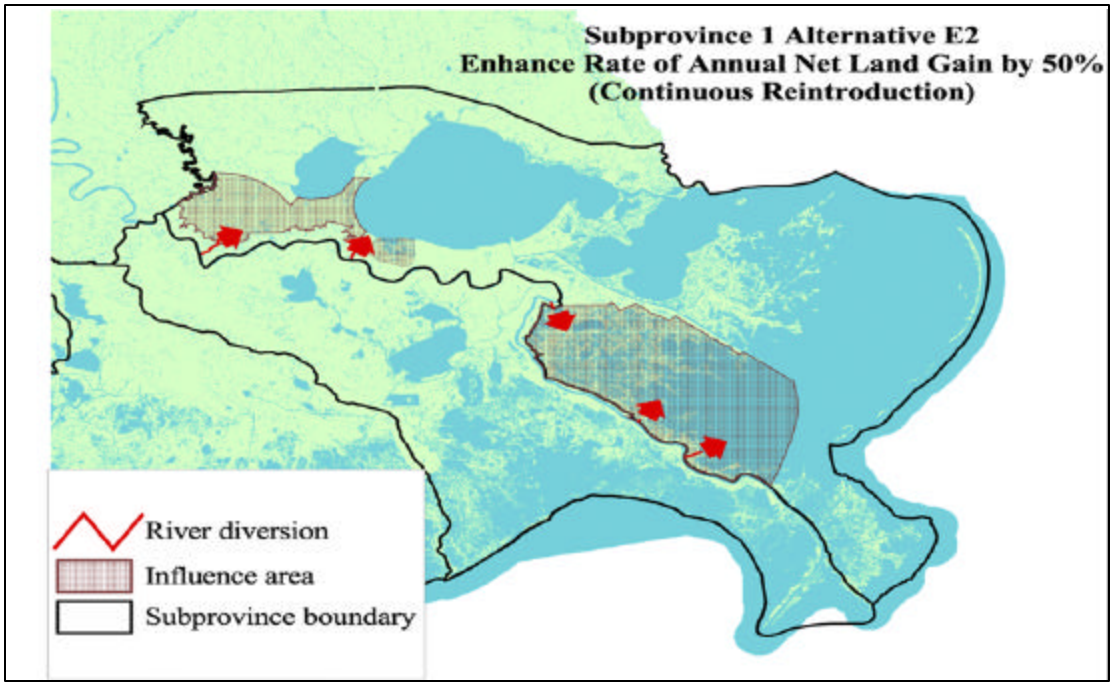
Maps of Continuous Reintroduction Alternatives



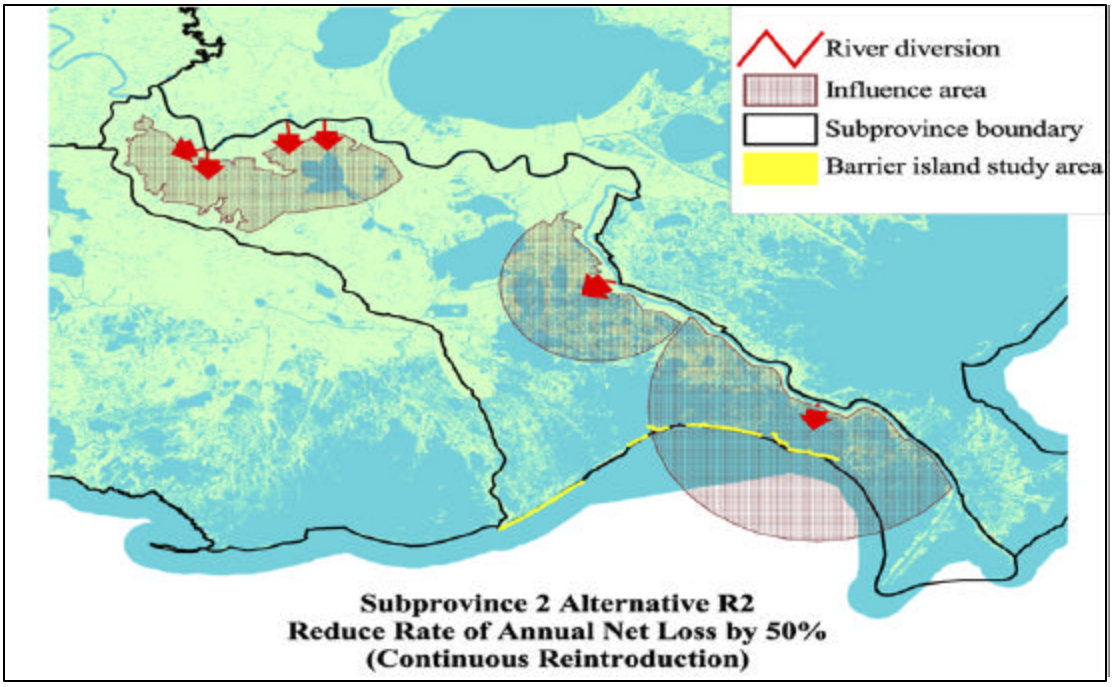
Alternative R2 – Continuous reintroduction
Three small diversion in the upper basin and one medium diversion in mid-basin. Repair and use the Bayou Lamoque structures for a medium diversion.



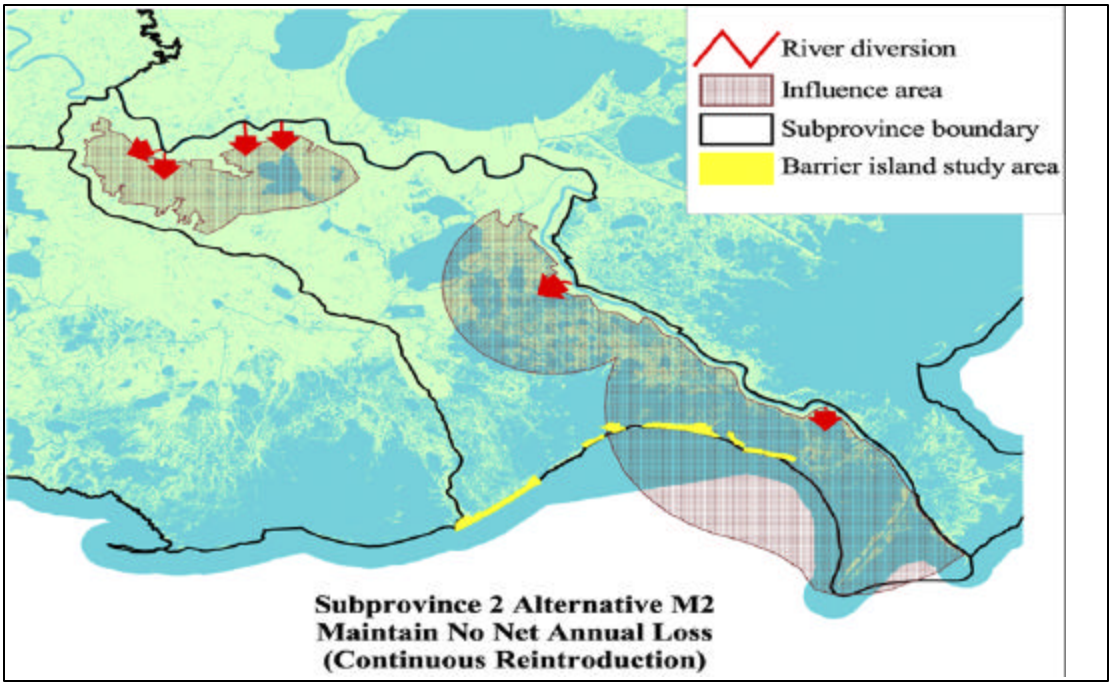
Alternative M2 – Continuous reintroduction
Two small diversions in the upper basin. One medium diversion mid-basin. One large diversion in the lower basin. Repair and use the Bayou Lamoque structures for a medium diversion.



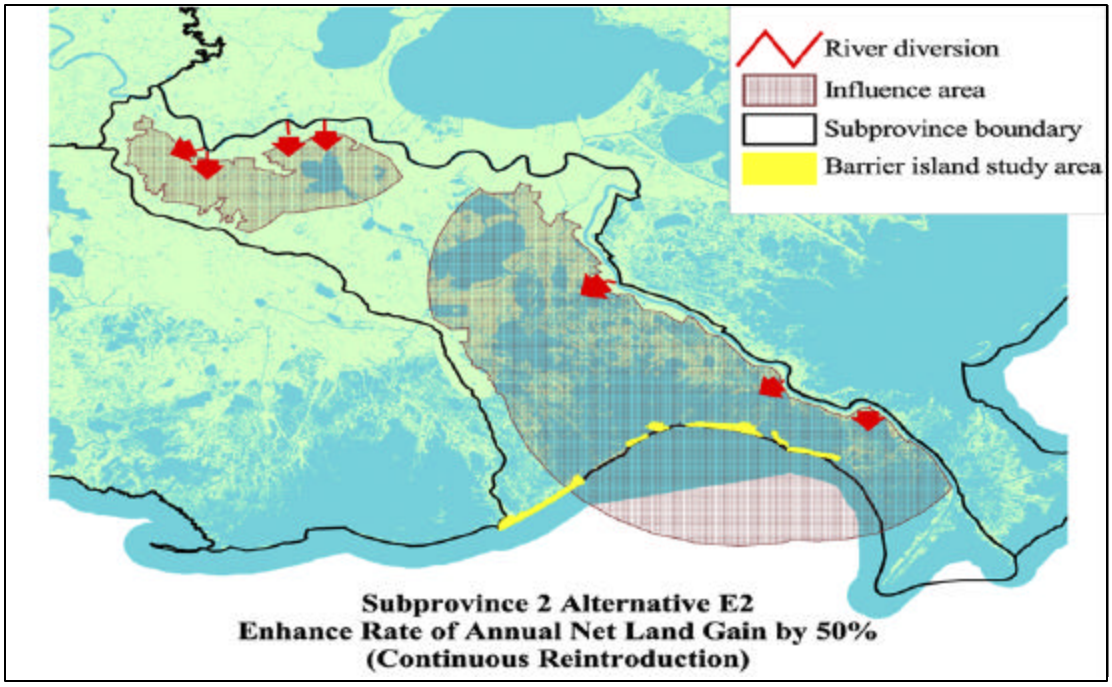
Alternative E2 – Continuous reintroduction
Two medium diversions in the upper basin. Mid-basin with one large diversion which will include sediment enrichment. One medium diversion in the lower basin. Repair and use Bayou Lamoque structures for a medium diversion.



Alternative R2 – Continuous reintroduction
Four small diversions in the upper basin. One medium sized and one large diversion in the lower basin. Feasibility study of barrier shoreline.



Alternative M2 – Continuous reintroduction
Four small diversions in the upper basin. One medium sized and one large diversion in the lower basin both with sediment enrichment. Feasibility study of the barrier shoreline.

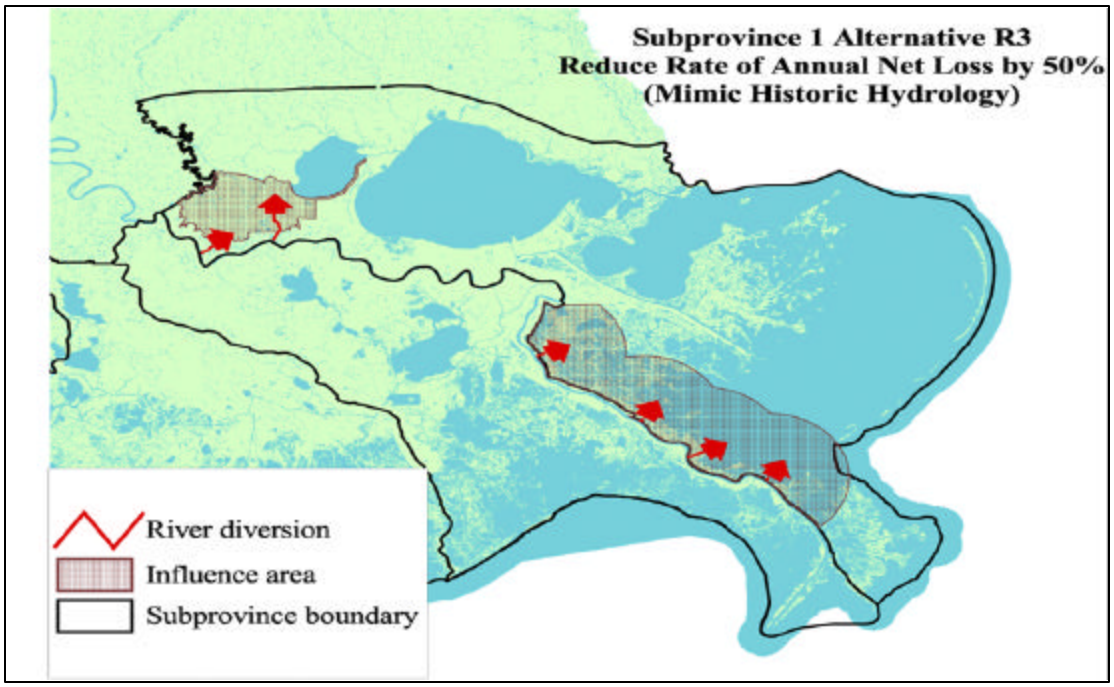


Alternative E2 – Continuous reintroduction
Four small diversion in the upper basin with sediment enrichment. Three large diversions in the lower basin, two with sediment enrichment/marsh creation. Feasibility study of the barrier shoreline.

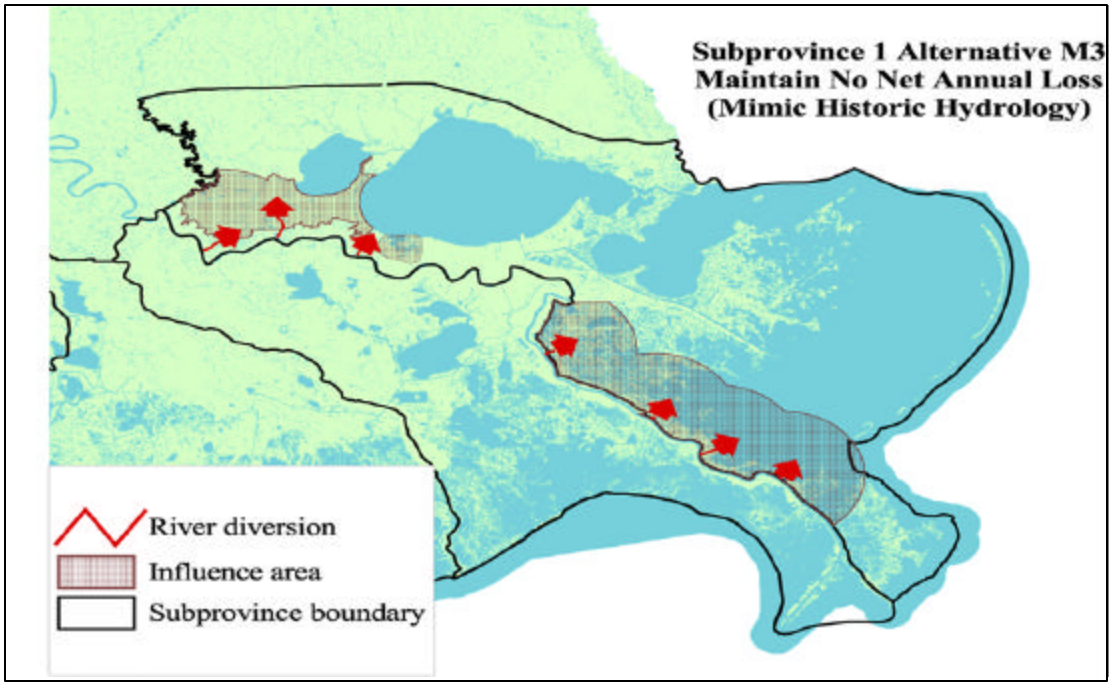
Mimic Historic Hydrology

Alternatives under this approach are based on the assumption that historic hydrologic regimes (apart from river switching) in the Deltaic province were characterized by numerous, smaller seasonal freshwater inflows (from over-bank flow, small distributaries and/or minor crevasses) combined with relatively short-term episodes of large freshwater inflows due to major, flood-induced crevasses. Alternatives designed under this approach tend toward including numerous, smaller reintroductions combined with large reintroduction projects to be operated in periodic "pulsing" events. Where appropriate, alternatives under this approach also include sediment enrichment of reintroduction waters to mimic the historically higher sediment loads in the Mississippi River.

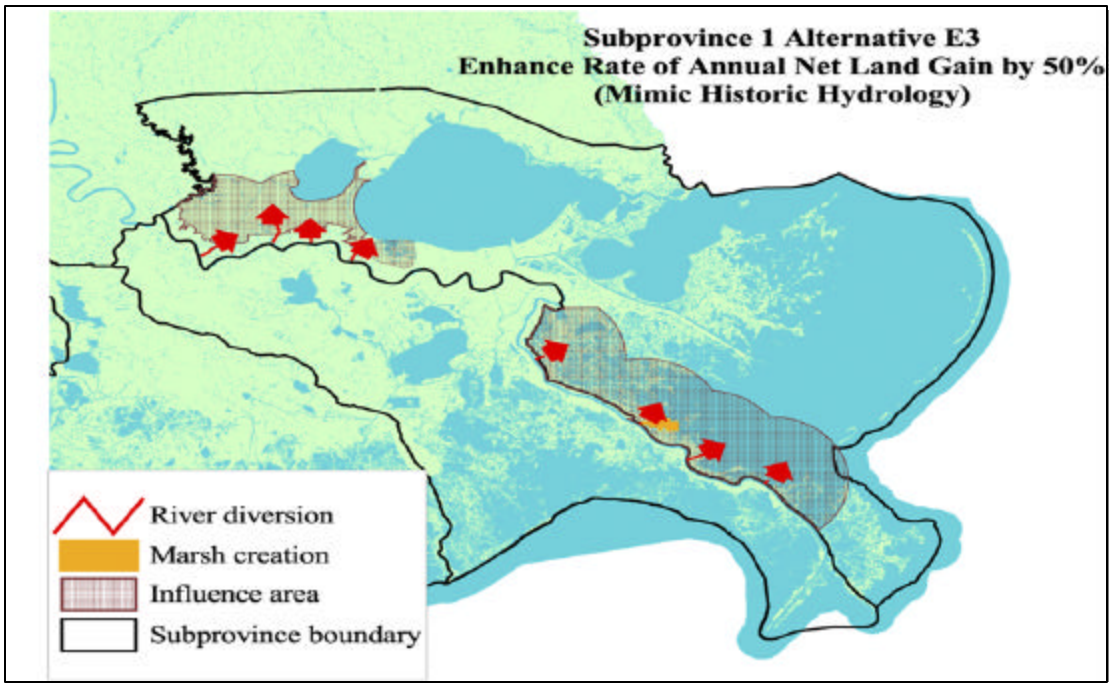
Maps of Mimic Historic Hydrology Alternatives



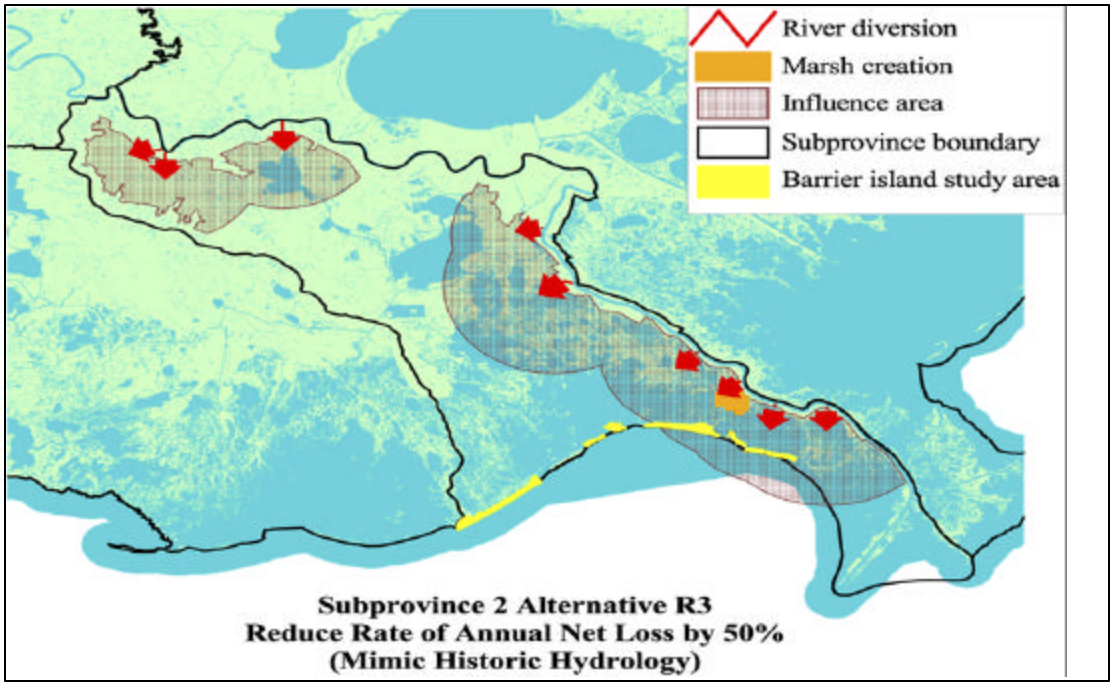
Alternative R3 – Mimic historic hydrology
Two small diversions in the upper basin. One medium diversion mid-basin. One medium and one large diversion with sediment enrichment in the lower basin. Repair and use the Bayou Lamoque structures for medium diversion.



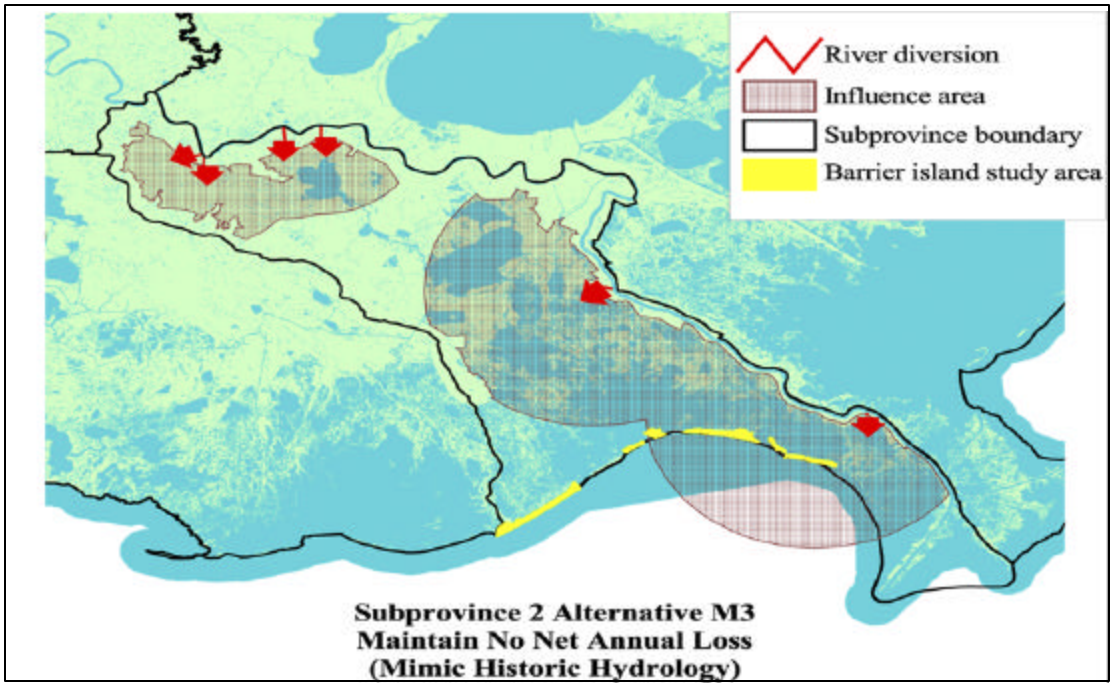
Alternative M3 – Mimic historic hydrology
Two small diversions and one medium sized diversion in the upper basin. One medium diversion mid-basin. In the lower basin one medium and one large diversion, both would include a sediment enrichment. Repair and use Bayou Lamoque structures for medium diversion.



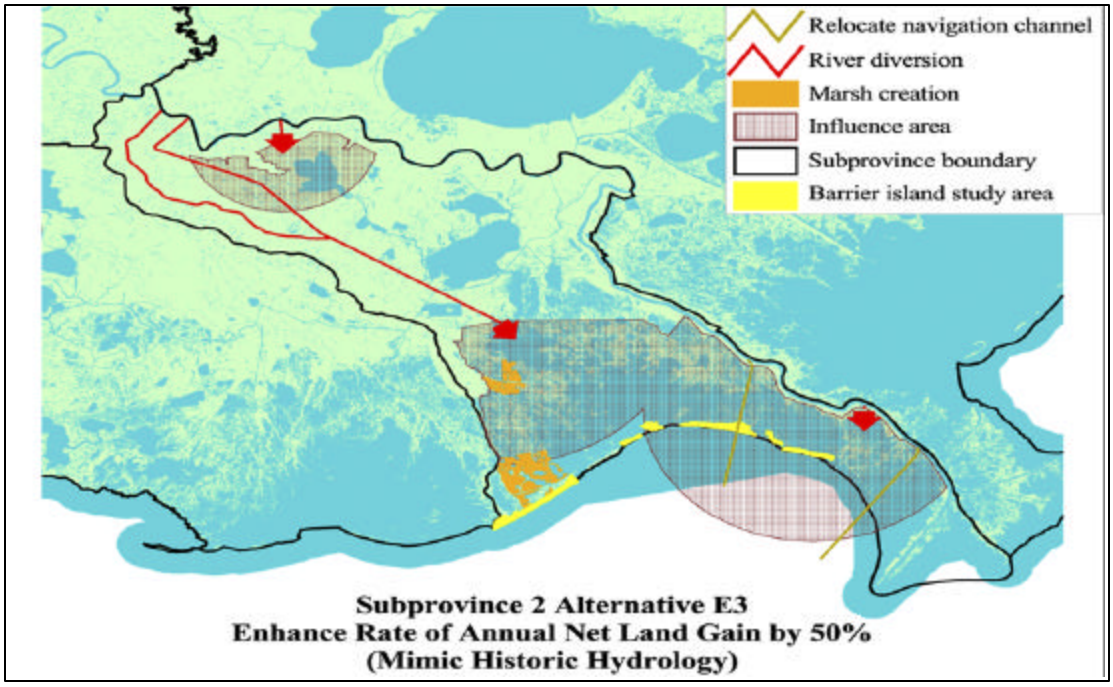
Alternative E3 – Mimic historic hydrology
Three small diversions and one medium diversion in the upper basin. One medium diversion mid-basin. In the lower basin two large diversions which will include sediment enrichment. Repair and use Bayou Lamoque structures for medium diversion. Sediment delivery/marsh creation at American/California Bay.



Alternative R3 – Mimic historic hydrology
Three small diversions in the upper basin. Five small diversions and one large diversion with sediment enrichment in the lower basin. Sediment delivery near Empire. Feasibility Study of barrier shoreline.



Alternative M3 – Mimic historic hydrology
Four small diversions in the upper basin. Two large diversions in the lower basin both with sediment enrichment. Feasibility study of the barrier shoreline.



Alternative E3 – Mimic historic hydrology
One small diversion with sediment delivery in the upper basin. In the lower basin, one large diversion and Third Delta with sediment enrichment. Sediment delivery/marsh creation in lower basin. Relocate main navigation channel. Feasibility study of the barrier shoreline.